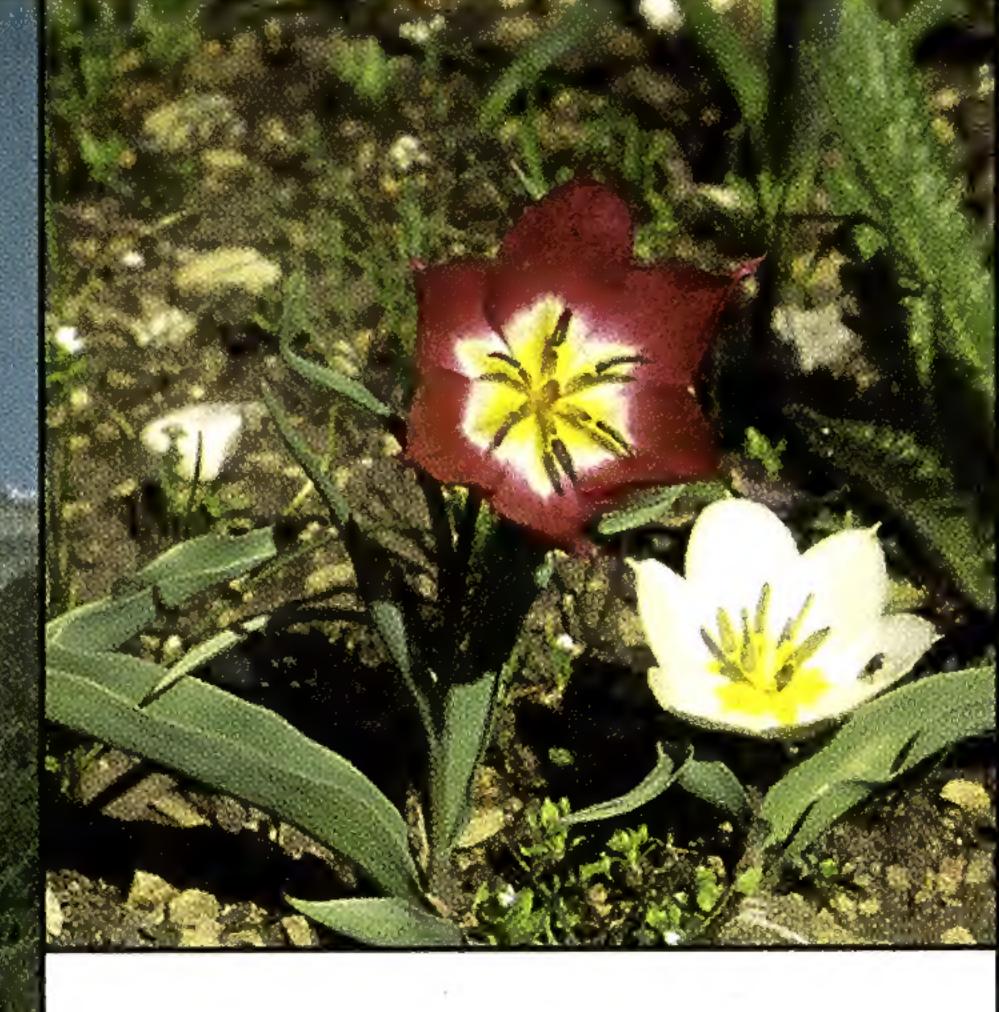


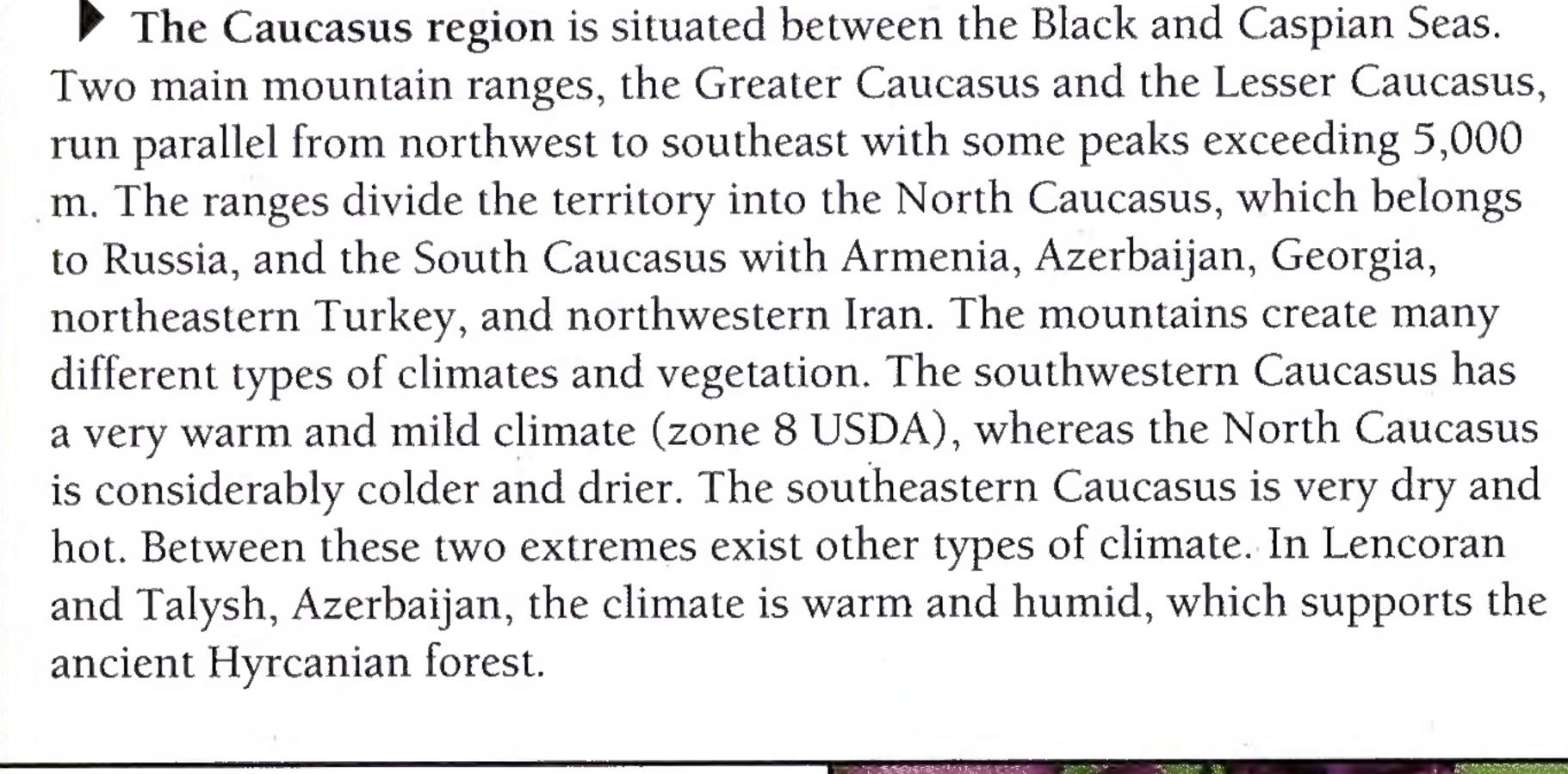
Missouri BOTANICAL RESEARCH: CAUCASUS REGION



The Caucasus—region of great beauty and mystery. According to Greek mythology, the Argonauts searched there for the Golden Fleece, and in the Bible, Noah landed his Ark on Mt. Ararat. The Caucasus is also one of the world's biodiversity hot spots, characterized by high levels of plant diversity and endemism. There are 6,300 species of vascular plants, of which 2,800 are endemic, occurring only in the Caucasus. The flora includes representatives from tropical families (Dioscoreaceae and Rafflesiaceae), and genera with Asian (Himalayan) and Mediterranean relationships. Pictured here is one of the principal peaks, Mount Kazbek (5,047m).



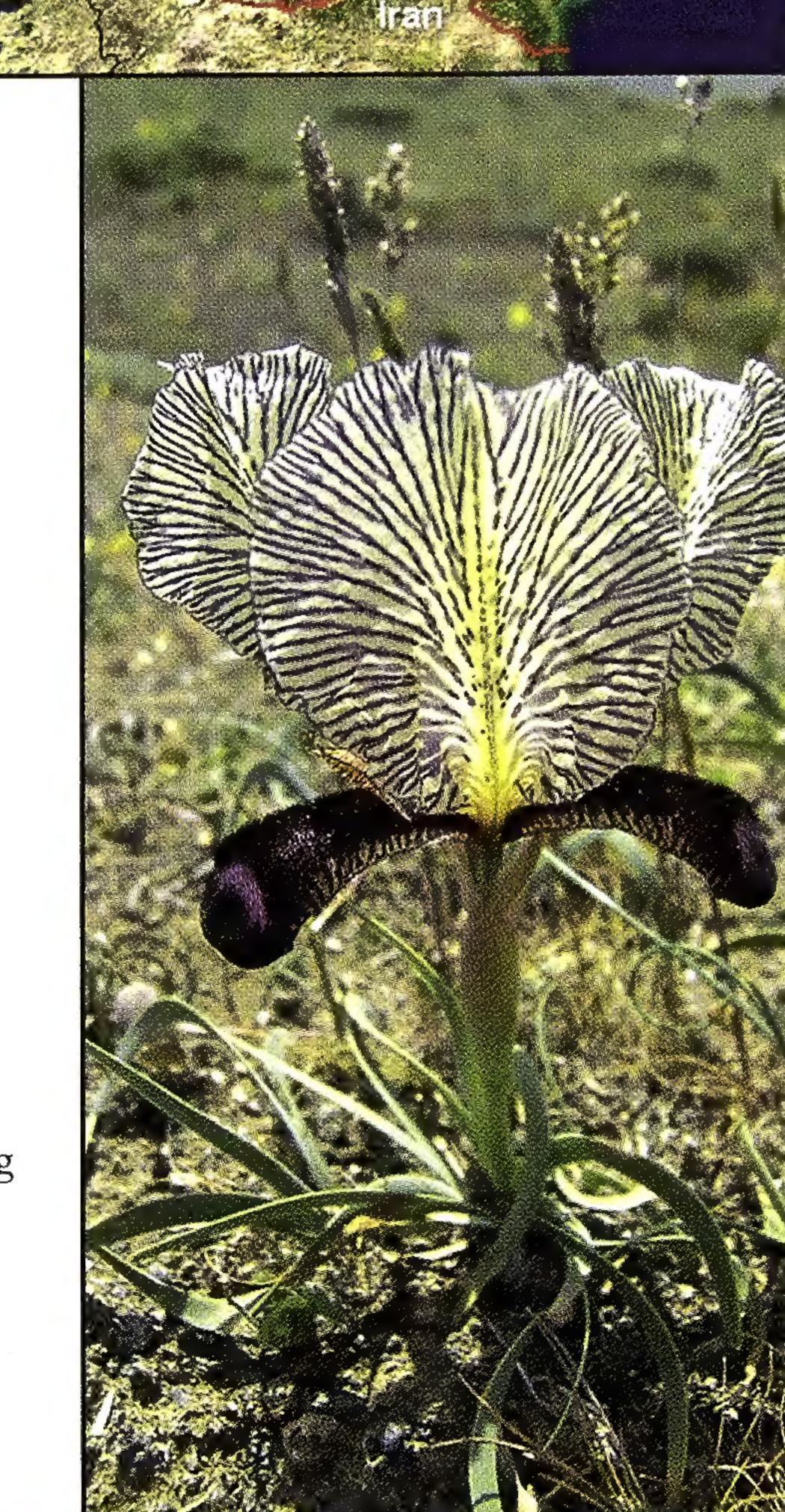
Tulipa gesneriana— The origin of cultivated tulips has long been a mystery. Assumed to have come from Turkey, attempts to find this wild tulip were unsuccessful. Dutch scientists established that the first bulbs came from the Crimea. Russian taxonomists concluded that Tulipa gesneriana is the ancestor of cultivated tulips; it occurs in the North Caucasus and southern



Gladiolus murgusicus is a recently described species, known only from the Idzhevan region of Armenia. There are 10 species of Gladiolus in the Caucasus, five of which are endemic to the South Caucasus. Among them, G. dzhavakheticus differs from others by its upright, almost actinomorphic flowers. Nearly all are unknown in cultivation.



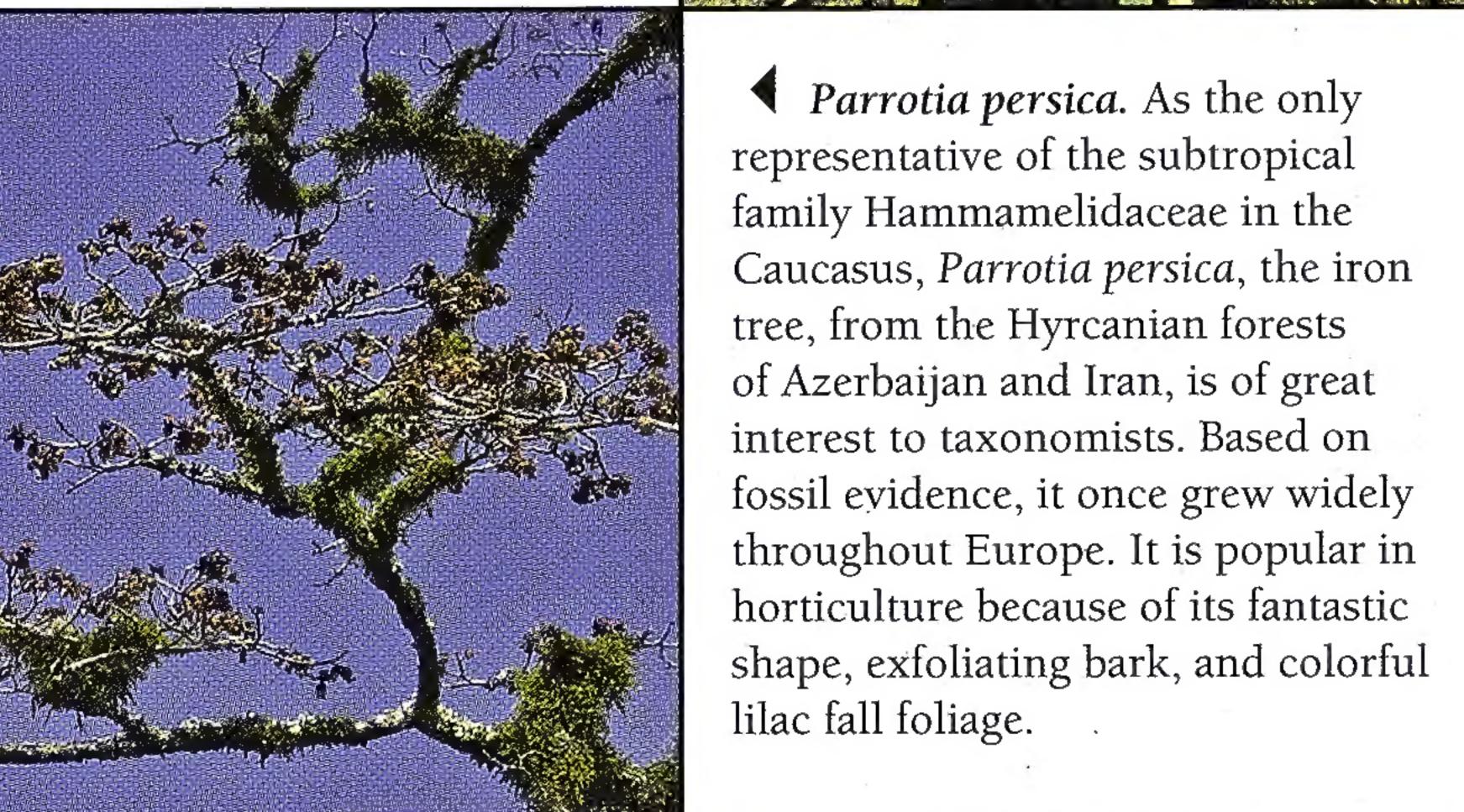
Iris medwedewii is is an extremely rare species in the Caucasus, occurring mostly in Talysh, Azerbaijan; it also occurs in northeastern Turkey and northwestern Iran. Azerbaijan occupies the southeastern part of the Caucasus. Half the territory is mountainous area above 1,000 m, with Bazar-Duzi the highest point at 4,466 m, though some places are below sea level. The flora of Azerbaijan falls into three floristic provinces: Caucasian, Hyrcanian, and Armeno-Turanian, and thus is very rich, consisting of 4,500 species, with 950 Caucasian and 200 national endemics. The silk tree (Albizia julibrissin)—popular worldwide in horticulture originated from this region. Among the flora are many useful plants including 800 medicinal species used in folk medicine, 100 of which are already of commercial importance. (T.S.)



Traditional breadmaking methods are still used in the Caucasus. Many food plants were first domesticated in this region, including pomegranate, plum, rye, and Colchis's flax. The most important is wheat. There is no other place in the world where wild cereals are so numerous. Wild species of Triticum and Aegilops found in the Caucasus are currently undergoing studies by the USDA.

Grape Vitis vinifera subsp. sylvestris. Molecular studies conducted at Washington University by Dr. Barbara Schaal, Dr. Tengiz Beridze, and Dr. James Beck have concluded that the Caucasus is the possible origin of this grape, with five chlorotypes detected within the analyzed wild grape populations. This supports the theory that grapes were first domesticated in the southwestern Caucasus.

Alpine meadow with anemone. Armenia is situated in the southern Caucasus. Its flora includes 3,500 species of vascular plants, with 850 Caucasian and 126 national endemics. Forests occupy only 9 percent of the territory, with the mountainous areas often consisting of exposed, bare, rocky ground with xerophytic plants. However, close to the snowline, magnificent alpine and subalpine meadows with Anemonaster fasciculatum thrive. The Armenian flora includes many promising wild relatives of crop plants, including cereals, almond, apple, cherry, plum, quince, and 20 species of pears. Some plants are used locally and could be developed worldwide as new food (such as Bilacunaria, a source of oil) or new medicinal plants.





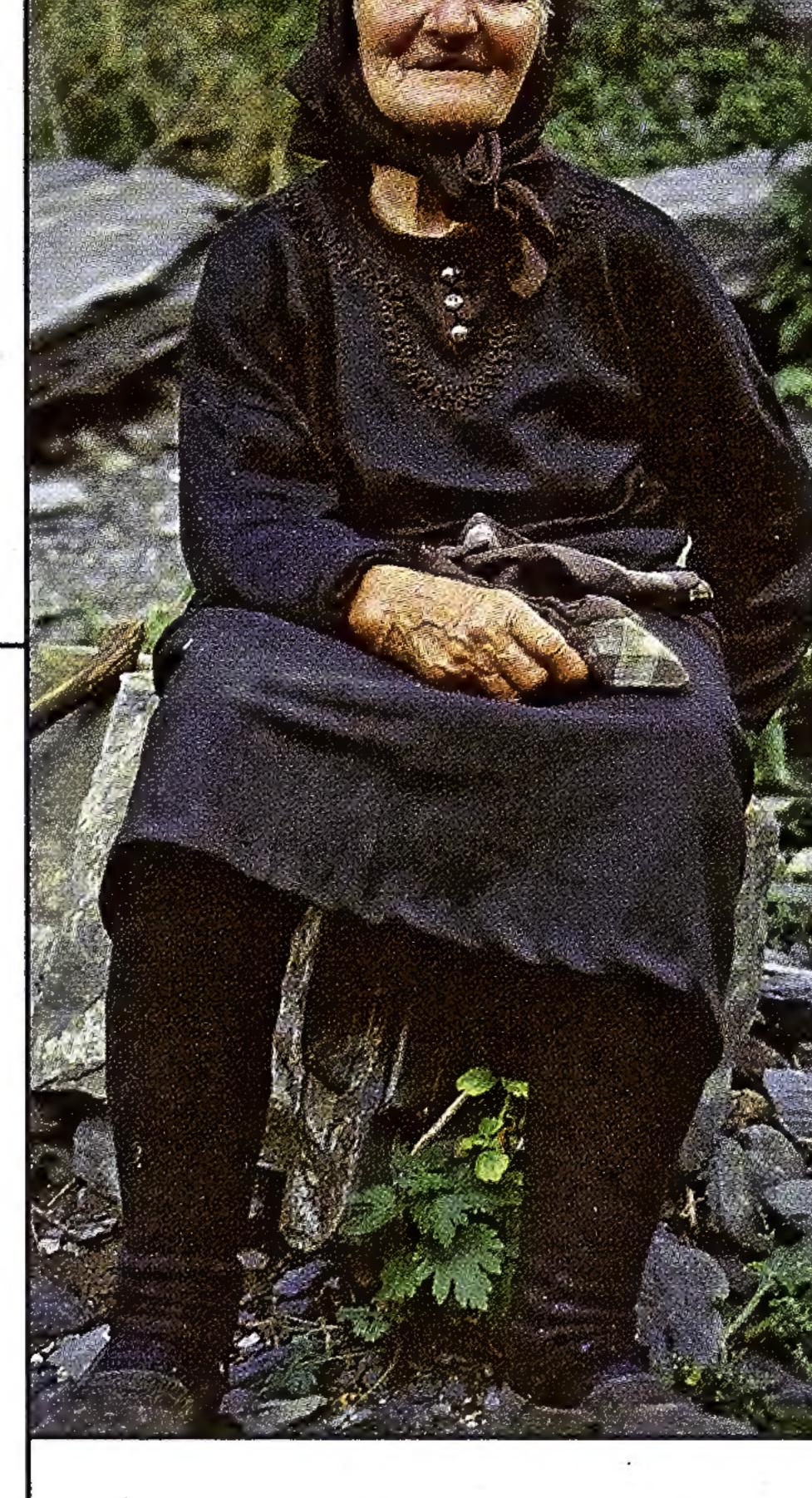
A Galathus platyphyllus. There are 11 species of snowdrops in the Caucasus, all of which flower when patches of snow still remain. Galanthus species are not only important ornamentals, but are also important medicinal plants that contain numerous alkaloids, including galanthamine, which is used for treatment of Alzheimer's disease. Although it is illegal to export bulbs, poachers collect many thousands every year. Many other medicinal plants, such as the wild yam Dioscorea caucasica, are threatened by wild collecting and must now be protected not only in nature but also in botanical garden collections through ex situ conservation efforts. Snowdrops flower as early as February, but can even be forced to flower by Christmas and the New Year.

Paeonia steveniana. In the Caucasus one can find 13 species of wild peonies exhibiting colors from white or pale yellow (P. steveniana, P. wittmanniana), to yellow (P. mlokosewitschii), pink (P. lagodechiana), and bright red (P. caucasica, P. carthalinica). All of them adapt well to different climates and are good sources for horticulture.



■ Village in Iran. The iron tree-dominated Hyrcanian forest occupies the southeastern part of Azerbaijan and continues into Iran along the Caspian Sea. Although there are hundreds of different nationalities in the Caucasus, one can see old villages in different parts of Dagestan, Iran, and Turkey that were constructed in the same practical style. The Caucasian part of Iran includes approximately 3,000 species, with 460 Caucasian and 195 national endemics. It can be divided into two parts: an eastern forested area with high rainfall, and a dry, hot western area with montane steppe, subalpine, and alpine vegetation.





Centenarian. This woman is 100 years old. The Caucasus region is renowned for the longevity of its people. Notwithstanding a genetic component to aging, there are some mountain villages where people live longer than in other places. Gerontologists who have studied their lifestyle and diet have found that these people drink spring water and eat many vegetables and wild herbs. The set of herbs differs between regions, but some that are in common include saffron (added to beverages), thyme (in beverages and meat), and black elderberry (as a beverage and as food coloring).

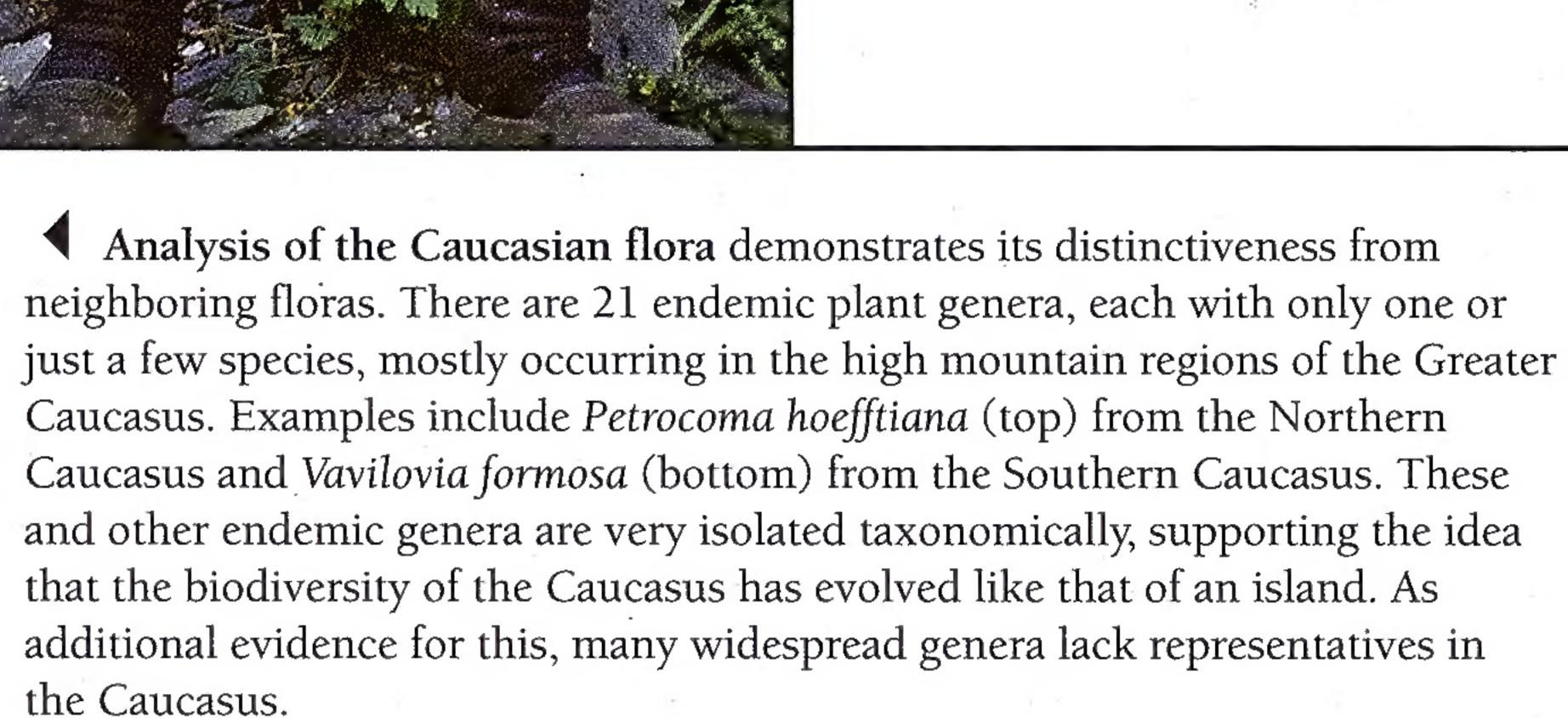
Colchis forest. The picture was taken in winter, showing holly shrubs, laurel, ivy, cherry laurel, and different conifers. With its mild, humid winter and annual precipitation of over 3,000–4,000 mm, the Colchis forest in the southwestern Caucasus region of Georgia and Turkey contains many evergreen species. These forests along the Black Sea possess a climate unique in the Northern Hemisphere, and have thus served as a refuge for many species. Other parts of Georgia have high mountains with alpine vegetation, whereas in the southeastern region there are steppes and even semideserts. The Georgian flora consists of 4,100 species, with 1,250 Caucasian and 270 national endemics. In this area one can see little-known endemic species of Rhododendron: R. ungernii and R. smirnowii and other plants that survive in this refuge.

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great promise for horticulture.

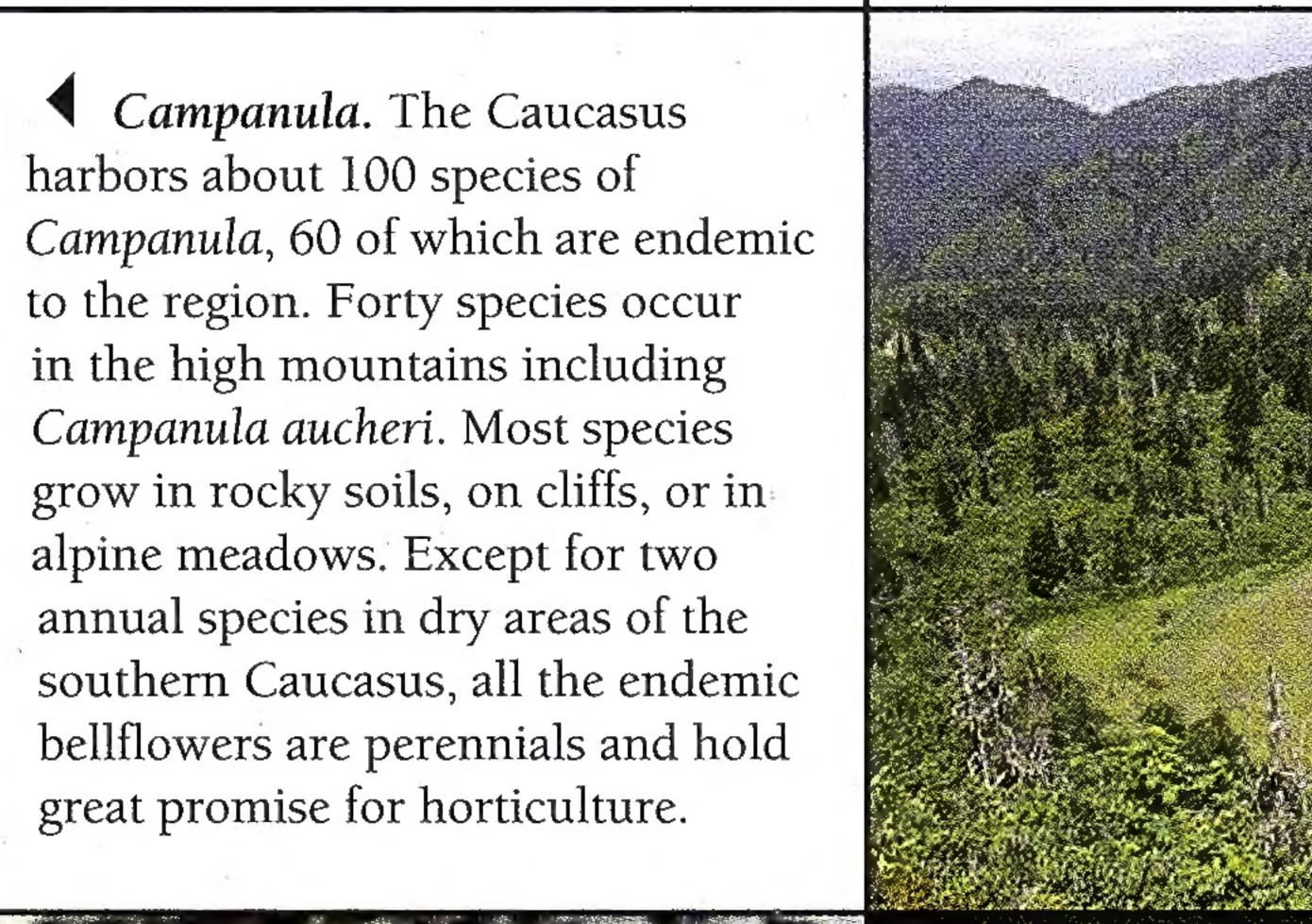






Muehlenbergella oweriniana. The North Caucasus lies within nine different administrative units of the Russian Federation. The region contains 3,700 plant species, with 1,300 Caucasian and 280 national endemics. Most of the territory is a fertile agricultural plain producing barley, rice, sunflower, and wheat. Forests are concentrated in the southwestern

mountains, whereas steppe and shrub formations prevail in the east. The endemic genus/species Müehlenbergella oweriniana, which occurs in Dagestan, is closely related to the genus Edraianthus with species in the Balkan and Apennine peninsulas, thus illustrating the relationship between the Caucasian and Mediterranean floras. Many Caucasian endemic species grow in the mountains of Dagestan.



Nordmann's fir (Abies nordmanniana) and oriental spruce (Picea orientalis), both endemic to the Caucasus, dominate in the high mountain zone in the Karagol region of the Turkish Colchis. At lower elevations, a broad leaf forest with beech (Fagus orientalis), chestnut (Castanea sativa), many species of oaks (Quercus spp.) and evergreen Laurocerasus cherry extends to the Black Sea.





The Caucasian part of Turkey contains over 4,000 species, with 400 Caucasian and 210 national endemics. Among them is an endemic shrub, Rhodothamnus sessilifolius, closely related to Rhododendron. Well-known rhododendrons from the Colchis forest include R. ponticum and R. luteum; less well-known are the endemics R. smirnovii and R. ungernii. At timberline, one can see a tall shrub, Medvedew's birch (Betula medwediewii), with unusually large leaves that turn bright yellow in autumn. Toward the south, the vegetation changes to grass steppe with many spring flowering bulbs. Plants endemic to the Caucasian part of the country include several unique monocots: saffron, Crocus (7 species), Iris (5), Lilium (3), and Tulip (2).

MBG's Caucasus Region Researchers (author of text): Text by Dr. Tatyana Shulkina and Dr. George E. Schatz

Photos by: O. Abdaladze, Vahid Farzaliev, George Fayvush, Vugar Kerimov, Anatoly Mikheev, Ramazan Murtazaliev, Jalil Noroozi, Salih Terzioglu, and Municipality of Kahetia region. Drawings by Dr. Svetlana Litvinskaya. Selection and technical work was made by Dr. Burgund Bassüner.

Science and Conservation at the Missouri Botanical Garden

Since 2003, the Missouri Botanical Garden has played a key role in bringing scientists from the Caucasus together to address plant conservation in the region. Never before had representatives from the six Caucasian countries worked together to complete a comprehensive checklist of the endemic plants of the Caucasus region, and to evaluate their conservation status. Financial support was provided by the Trust for Mutual Understanding (TMU), the Critical Ecosystem Partnership Fund (CEPF), and the International Union for the Conservation of Nature (IUCN). Each country formed a team of botanists

and conservationists headed by a national coordinator: Armenia–Dr. Kamilla Tamanian; Azerbaijan–Dr. Valida Ali-zade; Georgia–Dr. Keti Batsatsashvili; Iran-Mr. Jalil Noroozi; Russia-Dr. Dmitry Geltman; and Turkey-Dr. Tuna Ekim. Dr. Georgi Nakhutsrishvili served as Regional Coordinator. The Project Coordinators were Dr. George E. Schatz and Dr. Tatyana Shulkina. All national endemics, as well as endemics restricted to two or three countries, were assessed according to the IUCN Red List Categories and Criteria. Among 1,200 species already evaluated EX-1, CR-170, EN-299, VU-217, NT-197, LC-100, DD–216. The result will be published as the Plant Red Book of the Caucasian Region (eds. Drs. James Solomon and George E. Schatz).

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Paeonia wittmanniana

Peonies are among the most popular of garden plants. There are 13 species of Paeonia in the Caucasus, exhibiting a range of colors from white to yellow, pink, and bright red. They represent a valuable source for future hybridization. Peonies have been known for centuries as medicinal and ornamental plants, as depicted in this plate of *Paeonia wittmanniana* Hartwiss ex Lindl from a rare book in the Missouri Botanical Garden Library.

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